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PROGRESS REPORT OPERABLE UNIT 3 PRODUCTION AREA FEBRUARY 1993

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Fernald Project

Remedial Investigation/ Feasibility Study

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Operable Unit 3
PRODUCTION AREA

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Introduction

The Remedial Investigation/Feasibility Study (RI/FS) is the blueprint for cleanup at the U.S. Department of Energy's Fernald Environmental Management Project. The nature and extent of contamination at the Fernald site and surrounding areas is being thoroughly investigated so that appropriate remedial actions can be formulated and implemented.

The Fernald site has been divided into five sections, known as Operable Units, for environmental investigation and cleanup. The Operable Units were defined based on their location or the potential for similar technologies to be used in the ultimate cleanup.

During the course of the RI/FS effort, certain conditions are occasionally identified which call for more immediate action. These actions are called "Removal Actions" and are initiated when there is a need to accelerate cleanup activities to address releases or potential releases of hazardous substances. Removal Actions are coordinated with the U.S. EPA and the Ohio EPA.

Following is a progress report on Operable Unit 3 including its history, the current status of RI/FS activities, cleanup alternatives under consideration, and work that is being done to alleviate near-term concerns.

Background

Operable Unit 3, the former production area and other suspect areas, is one of the largest and most complex of the Fernald site Operable Units, largely due to the wide variety of former processing facilities located in this 136-acre study area. When the mission at the Fernald site was production of high-purity uranium metal for U.S. defense programs and the processing of thorium to support other DOE programs, large quantities of radioactive materials and hazardous chemicals were used in the various plants involved in the process. Operable Unit 3 focuses on cleanup of contamination in the former production area resulting from the 37-year production mission at the Fernald site. The primary contaminant is uranium, and the main focal points of cleanup are buildings, equipment, and support facilities.

RI/FS Activities

RI/FS Work Plan Addendum: The scope of Operable Unit 3 was modified by the Amended Consent Agreement to include all former process buildings, structures and equipment, and inventoried materials.

The Work Plan Addendum contains an evaluation of available site characterization data and process knowledge, and identifies the need for additional data to evaluate risks and remedial alternatives. The Addendum also includes discussions of various RI/FS tasks required, and schedules for conducting those activities.

The Work Plan Addendum also contains a recommended approach to be used in data collection, a proposed sampling and analysis plan, preliminary remedial action objectives, and remedial action alternatives. Field sampling procedures unique to Operable Unit 3, and a program to train the field sampling personnel are now being developed.

The RI/FS and Work Plan for Operable Unit 3 have been clarified based on U.S. EPA comments. The revised Work Plan Addendum incorporating U.S. EPA comments was submitted to the U.S. EPA in December 1992, for review.

Schedule Modification Request: The DOE has proposed to U.S. EPA to accelerate the decontamination and decommissioning of former production buildings for this work to begin earlier than agreed to in the September 1991 Amended Consent Agreement. The Amended Consent Agreement schedule calls for a Record of Decision (ROD) date of May 2, 1997, for the decontamination and decommissioning of former production facilities and the disposition of waste from that area. The original May 1997 ROD date would be retained for the waste disposition issues in Operable Unit 3.

Removal Actions

Plant 1 Pad Continuing Release (Removal Action No. 7): The purpose of this Removal Action is to protect surface soils and regional groundwater from continuing releases of hazardous materials resulting from waste management activities on the eight-acre Plant 1 storage pad. This Removal Action is being conducted in three phases.

Phase I, the implementation of run-on and run-off control measures and the installation of underground utilities, is complete.

Phase II, the installation of a new covered concrete storage pad (80,000 square feet) adjacent to the existing Plant 1 storage pad, was completed December 4, 1992. Remaining drums of low-level radioactive waste in outdoor storage on the Plant 1 Pad are being moved into the two new covered storage structures, which are equipped with containment facilities for spill control, drainage, and stormwater runoff/run-on control.

Phase III involves activities to upgrade the existing Plant 1 storage pad, including the installation of a polyethylene membrane and epoxy coating over the pad surface to minimize contaminant migration to the environment. Phase III is on schedule for completion by February 19, 1995.

Removal of Waste Inventories (Removal Action No. 9): This Removal Action involves the characterization, overpacking, and disposition of low-level radioactive waste materials. The removal of waste inventories is ongoing at Fernald.

The Fernald site has approval from the DOE Nevada Field Office to dispose of five general waste streams at the Nevada Test Site (NTS), including: process area scrap wastes (scrap metal and wood); construction and Removal Action waste (demolition debris); residues and thorium waste (refinery feed and oxides); and baled trash. The approval includes all backlog and currently generated wastes at Fernald, which can be shipped to NTS for disposal contingent upon meeting all NTS Waste Acceptance Criteria.

The Fernald Field Office is presently seeking approval from the Nevada Field Office to ship additional low-level thorium waste to NTS. Previous shipments of thorium oxide material from the dismantled Plant 8 silo and bin were completed in September 1992.

Fernald shipped more than 100,000 drum equivalents (DEs) of low-level radioactive waste to NTS in Fiscal Year 1992. This included 37,000 DEs of metal, 34,249 DEs of wood, 21,323 DEs of construction rubble, 6,010 DEs of baled trash, and 1,621 DEs of thorium oxide.

The low-level radioactive waste shipping goal for the first nine months of Fiscal Year 1993 (through June 30, 1993) is 117,000 DEs. This goal includes currently-generated waste from construction and restoration activities (30,000 DEs), characterized backlog waste (30,000 DEs), scrap metal (40,000 DEs to eliminate the scrap metal and scrap copper bulk storage areas), and process area scrap metal (17,000 DEs). These accelerated waste shipping activities are proceeding on schedule. Waste shipping schedules for the last three months of Fiscal Year 1993 (July 1 through September 30) are being developed.

Stabilization of Uranyl Nitrate Inventories (Removal Action No. 20): The processing of uranyl nitrate inventories was initiated in September 1992. In November 1992, after the initial 20,000 gallon batch had been processed as part of a systems operability test, the system was placed on hold to allow for an evaluation of systems. Processing of uranyl nitrate inventories will resume in early 1993. The Removal Action is expected to be completed in late 1993.

Uranyl nitrate is an intermediate product in the former uranium recovery process at Fernald. There are approximately 230,000 gallons of acidic uranyl nitrate stored in 21 tanks in or near the Plant 2/3 Refinery.

A 1991 inspection of the tanks revealed that small leaks had developed in the piping system associated with the tanks. This Removal Action is designed to process the uranyl nitrate to a stable form. The uranyl nitrate inventory will be neutralized and converted to a solid form which can be drummed and properly stored in warehouses pending final disposition.

Safe Shutdown (Removal Action No. 12): This Removal Action was initiated to ensure the safe and permanent shutdown of production facilities, including the removal of uranium and other process/raw materials from equipment and lines in the former production area. Disposition of uranium products and recoverable residues is an integral part of Safe Shutdown activities.

Preliminary assessments of the scope of actions required to achieve a safe shutdown configuration of buildings and equipment are continuing for each major process area.

An annual update of Fernald site procedures to ensure that appropriate documentation of Safe Shutdown activities is entered into the Administrative Record is due to the U.S. EPA June 30, 1993.

Since the production mission ended in July 1989, 11.1 million pounds of uranium products have been transferred from Fernald under the Safe Shutdown program through December 31, 1992.

Plant 1 Ore Silos (Removal Action No. 13): This Removal Action will involve the dismantling of the Plant 1 Ore Silos and their support structures. Due to deteriorated valves, materials leaked from the silos onto an elevated concrete pad in February 1991. The material, known as cold raffinate, is the waste residue from the processing of uranium ore after uranium is removed. Remaining material in the silos will be removed, containerized and placed in safe storage pending final disposition. All 14 silos and support structures will be dismantled under this Removal Action.

The company to perform the work has incorporated comments into a revised detailed work

plan. The revised plan was resubmitted on January 22, 1993. Work is tentatively scheduled to begin in February 1993. This Removal Action is scheduled for completion by December 18, 1994.

Contaminated Soils Adjacent to Sewage Treatment Plant Incinerator (Removal Action No. 14): The scope of this Removal Action includes the isolation or removal and disposition of contaminated soils with elevated levels of uranium in the vicinity of an out-of-service solid waste incinerator at the sewage treatment plant. The project is designed to mitigate the potential for contaminant migration. Current activities include characterization, removal, containerization, storage and disposal of materials.

The first phase of the Removal Action (characterization) discovered a larger area of contamination than previous sampling had indicated. Contaminated soils from subsequent excavation activities that took place in October 1992 were placed in 187 white metal boxes to await a decision on disposal of the material.

A Work Plan Addendum detailing the need for additional excavations based on recent analytical results was submitted to the U.S. EPA January 6, 1993, for review. The submitted Work Plan Addendum contains a new schedule. Additional excavation activities specified in the Work Plan Addendum are planned for completion by May 15, 1993.

Scrap Metal Piles (Removal Action No. 15): This Removal Action will address the stabilization and disposition of low-level radioactive waste scrap metal currently stockpiled outdoors at Fernald. The project is designed to eliminate the potential threat of material releases to the environment due to wind or rain from 1,300 tons of scrap copper and about 2,210 tons of recoverable ferrous scrap metals.

Containerization of the scrap copper pile, including scrap copper ingots, was started ahead of schedule on October 26, 1992. Containerization is scheduled for completion by April 1, 1993.

A Request for Proposal has been initiated for the off-site processing of the scrap copper pile. The contract emphasizes recycling or other beneficial reuse.

A contract has been awarded for the final disposition of 2,210 tons of ferrous scrap metal at Fernald. Field activities associated with the scrap metal piles were initiated in November 1992. The U.S. EPA has approved the work plan. The contract emphasizes recycling or other beneficial reuse. Most of the 2,210 tons will be reused.

Non-recoverable scrap metal at Fernald is presently being packaged into appropriate containers and shipped off site for disposal under Removal Action No. 9 (Removal of Waste Inventories).

Improved Storage of Soil and Debris (Removal Action No. 17): This Removal Action provides for the improved storage and management of contaminated soil and debris generated as a result of performing cleanup at Fernald. Activities under this Removal Action will include characterization, interim storage, and management of contaminated soils and debris until their final disposition under Operable Unit 3.

The U.S. EPA has granted approval of the work plan, and DOE is preparing the final revision of the work plan.

Detailed design of the above-ground structures and facilities has been initiated to support this Removal Action. Tension Support Structures, similar to those currently being used to provide indoor storage for drummed waste on the Fernald site's Plant 1 Pad, will be used to provide improved storage of soil and debris and to mitigate the potential spread of contamination.

Plant 7 Dismantling (Removal Action No. 19): The work plan for this Removal Action is due to the U.S. EPA by April 20, 1993. Plant 7 was originally built to convert uranium hexafluoride (UF6) to uranium tetrafluoride (UF4). Plant 7 has been idle since the mid-1950s. All process equipment was removed from Plant 7 in the late 1950s. Plant 7 is presently being used to store approximately 5,000 drums of UF4, as well as empty cans and drums. Activities under this Removal Action will include characterization, decontamination, removal, containerization and disposal or reuse of materials in the building, and decontamination and dismantling of the building itself.

Pilot Plant Sump (Removal Action No. 24): This Removal Action was initiated to address contaminated liquids and sludges remaining in an out-of-service sump at the Pilot Plant. The below-grade sump is a stainless steel cylinder approximately two feet in diameter and 10 feet deep. The sump was installed to remove liquids from the floor drains of the Pilot Plant during the renovation of the Pilot Plant in 1969.

Analyses of the sludges and liquids from the sump show high concentrations of metals (lead, copper, chromium, and nickel), as well as thorium and volatile organic compounds.

Accumulated liquids have been pumped out of the tank on a monthly basis, and this activity will continue until the removal of the sump is initiated. Under this Removal Action, the stainless steel sump will be removed and its associated piping will be disconnected. The drain piping integrity will be checked and the drain system plugged. Adjacent soils will be cleaned up as required.

The U.S. EPA granted conditional approval of the revised draft work plan November 24, 1992. The DOE has submitted responses to U.S. EPA comments and is now waiting for U.S. EPA approval.

Nitric Acid Tank Car and Area (Removal Action No. 25): This Removal Action was initiated to remove the residual contents of a Nitric Acid Railroad Tank Car, decontaminate and dispose of the tank car itself, and address potentially contaminated surrounding soils related to the tank car. The high-grade stainless steel tank car stored nitric acid from 1952 until 1989 for use in the former production process at Fernald. The tank car has a capacity of 100,000 gallons and now contains approximately 100 gallons of dilute nitric acid. The work plan for this Removal Action was submitted to the U.S. and Ohio EPAs October 30, 1992. The U.S. EPA disapproved the work plan December 9, 1992. A 20-day extension was requested to adequately address RCRA/CERCLA integration of the work plan with closure issues and technical concerns, and to obtain results from recent sampling of the tank car contents. The revised work plan was submitted to the U.S. EPA January 28, 1993, for review.

Asbestos Removals (Asbestos Program) (Removal Action No. 26): This Removal Action documents ongoing asbestos abatement activities at Fernald to mitigate the potential for contaminant release and migration. Abatement activities within the existing Asbestos Program include repairs, encasement, encapsulation or removal of asbestos-bearing materials which exist in many buildings on the Fernald site. Field activities in support of asbestos identification and abatement are in progress. Specifications for large-scale asbestos removal projects are being submitted to the U.S. EPA prior to the start of field work.

Management of Contaminated Structures at the FEMP (Removal Action No. 27): This Removal Action was initiated to provide a mechanism to perform accelerated cleanup actions to mitigate any potential threat to human health and the environment associated with selected contaminated structures at Fernald. An Engineering Evaluation/Cost Analysis (EE/CA) to support proposed Removal Actions for managing contaminated structures at Fernald pending implementation of final remedial actions under Operable Unit 3, was submitted to the U.S. EPA December 14, 1992, for review. The U.S. EPA conditionally approved the EE/CA January 18, 1993.

Fire Training Facility (Removal Action No. 28): This Removal Action has been initiated to address an area historically used to simulate fire and emergency response conditions for training purposes. The Fire Training Facility is located just north of the former production area on the old North Access Road. Work will include removal, decontamination, and disposal, treatment or storage of all buildings, structures, tanks, and equipment. U.S. EPA concurrence to initiate this Removal Action was received February 8, 1993. The work plan is due to the U.S. EPA by June 30, 1993.

Temporary Nitrate Storage Tanks (Removal Action No. 29): This Removal Action has been initiated to address two out-of-service tanks used as temporary treatment units for nitrate wastewaters while the biodenitrification surge lagoon was being built in the waste storage area. The tanks will be emptied and cleaned. Water from the tanks will be characterized and treated through Fernald's existing water treatment facilities. Sludges from the tanks will be characterized, drummed, and dispositioned appropriately. U.S. EPA concurrence to initiate this Removal Action was received February 8, 1993. The work plan is due to U.S. EPA by July 15, 1993.

Sewage Treatment Plant Incinerator (Removal Action No. 30): This Removal Action has been initiated to address an incinerator formerly used to incinerate a variety of site wastes including motor oils, hydraulic oils, and possibly other spent solvents or oils including uranium contaminated materials. The incinerator has been out of service since 1979. It is located on the eastern edge of the Fernald site. The Removal Action will involve decontamination and dismantling of the incinerator, characterization and disposition of associated wastes, and containerization of equipment for shipping. U.S. EPA concurrence to initiate this Removal Action was received February 8, 1993. The work plan is due to U.S. EPA by July 30, 1993.

Cleanup Alternatives

Several cleanup alternatives have been identified for Operable Unit 3. All of these options include regular maintenance and monitoring. Much of the cleanup work involves the disposal of inventoried waste materials in either an on-site or an off-site disposal facility, removal and decontamination of buildings and equipment, and disposal of remaining contaminated materials in approved, engineered facilities either at the Fernald site or off site. Implicit within all Operable Unit 3 alternatives is an emphasis on the recycling and recovery of building materials and equipment to minimize waste disposal requirements. More definitive descriptions of alternatives will be provided in subsequent reports, pending U.S. EPA approval of the Operable Unit 3 Work Plan Addendum.

More information about Operable Unit 3 is available in the Public Environmental Information Center (PEIC), where Fernald Project cleanup documents are kept in the Administrative Record. The PEIC is located in the JAMTEK building, 10845 Hamilton-Cleves Highway, Harrison, Ohio, 45030. The telephone number is (513) 738-0164.